DETERMINANTS OF MATERNAL STYLE IN CONVERSATIONS ABOUT THE PAST: EFFECTS OF CHILD INDIVIDUAL DIFFERENCES

By

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TO MY FRIENDS WHO ENCOURAGED ME TO FOLLOW MY DREAMS
ESPECIALLY JUDY

AND

TO MY FAMILY WHO ALLOWED ME THE FREEDOM TO DO SO

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Previous research has indicated that mothers display stylistic differences when talking about shared past events with their children, and that these differences in turn affect the development of children's autobiographical memory. The purpose of this study was to examine the relationship between maternal style in memory talk and child individual differences, particularly gender and temperament variables. Specifically, are these stylistic differences shown by mothers elicited by some behavior or characteristic of the child she is interacting with at the time, or are they simply characteristics inherent in the mother?

Sixteen mothers, each with one male and one female child, served as subjects. In half the families the male child was older, and in the other half, the female child was older. Mothers interacted separately with each child and discussed several events they had participated in together in the past. Mothers also completed a temperament questionnaire (Dimensions of Temperament Survey-Revised, Windle & Lerner, 1986) for each child. Data were analyzed to detect relationships between maternal style and child gender, and activity level, approach-withdrawal, and task orientation, as measured by the DOTS-R, and to detect consistency in maternal style across children.

Results indicated that mothers were only moderately consistent in how they participated in memory talk with children who were different ages and genders. Maternal style did not differ by child gender, nor did overall maternal style differ by child age. However, mothers used a greater number of repetitions in memory conversations with their younger children than with their older children. Temperament variables played a small but significant role in determining maternal style: Overall level of elaboration was positively related to child activity level and number of repetitions was negatively related to approach-withdrawal and activity level. Mothers used fewer repetitions with children whom they had rated higher as being more sociable and more active.

Results are discussed in terms of their implications for a social interactional model of autobiographical memory development.

INTRODUCTION

One of the most intriguing aspects of human memory is autobiographical memory, the recollection of personally experienced and personally relevant events from our past. It is this part of our memory that gives us a history and a sense of self, unique and separate from others. Autobiographical memory seems relatively boundless in capacity, and relatively effortless as well, yet it nonetheless has limitations, the most notable of which is the omission of material from the first few years of life. This inability to recall events from early childhood has come to be known as infantile or childhood amnesia. A number of theories have been proposed to explain this phenomenon. One theory currently attracting considerable interest is a social interaction model endorsed by Hudson (1990) and Fivush (Fivush & Hamond, 1990; Fivush & Reese, 1993). This theory proposes that autobiographical memories emerge through a dialectical process as children participate in conversations about the past. In these interactions children gain an understanding of the social value of autobiographical memory as well as learning how to produce the canonical narrative structure such conversations take.

Research exploring the social interaction model has demonstrated that parents (primarily mothers) participate in memory talk in different ways, and these differences ultimately affect how children recall the past. The purpose of the current research was first to look for within-family consistency in maternal style, and then to examine the relationship between maternal style in memory talk and child individual differences, particularly gender and temperament variables. Specifically, are mothers consistent in conversational style when talking to offspring who are different ages and genders? If not, are these stylistic differences elicited by the gender or temperament of the child? To examine this, mothers with 2 children, one boy and one girl, talked about several past events individually with each child. Conversations were analyzed to detect relationships between maternal style of conversing about the past and child individual differences, in particular gender and temperament.

Review of Literature

Theories of Infantile Amnesia

Although the phenomenon of infantile amnesia has been well documented for many years (e.g., Dudycha & Dudycha, 1941; Waldfogel, 1948) little research was directed towards determining why adults were unable to recall events taking place before age 3. There were, however, theoretical explanations for this deficit. The earliest and perhaps best known was that advanced by Freud (1916/1963). Freud proposed that children form memories of events during the first few years of life, but that because these memories are associated with unacceptable sexual and aggressive impulses they are repressed and consequently unavailable for conscious recall. In fact, Freud saw as a goal of psychoanalysis the unearthing of these buried memories from childhood. Freud's theory implies that there should be few memories for events occurring before age 5 or 6, at which time the Oedipal complex should be resolved. Any memories prior to that time would be relatively benign screen memories, in place to guard the ego from disturbing impulses.

As Pillemer and White (1989) point out, however, empirical evidence supports none of these notions. Adults can recall events that took place in early childhood. Sheingold and Tenney (1982), for example, found that children who were at least 3 years old at the time a younger sibling was born could remember information about the event 16 years later. Similarly, Kihlstrom and Harackiewicz (1982) demonstrated that adults' earliest memories dated, on average, to around age 3 1/2. Usher and Neisser (1993) asked college students about their memories for four target events: birth of a sibling, a hospitalization, a death in the family, and a family move. Their results indicated that significant events occurring as young as age 2 may be remembered in adulthood.

Research also refutes the Freudian notion that there should be a sudden dramatic increase in the number of memories recalled after the offset of infantile amnesia around age 5 to 6. Waldfogel (1948), in a classic study of adults' childhood memories, found that college students reported a gradual increase in the number of memories recalled from around age 3 onward. Wetzler and Sweeney (1986) likewise found that although college students' forgetting of events that took place prior to age 5 was accelerated compared to forgetting of events after this age, there was nevertheless a gradual increase in the number of events recalled that took place between ages 3 and 5.

Nor does there seem to be any significant difference in the emotional content of memories from early childhood and those from later in life. Kihlstrom and Harackiewicz (1982), for example, reported that 27% of the childhood memories recounted by college students were negative in affect. Waldfogel's (1948) subjects rated 28% of their childhood memories as unpleasant or negative in affect. These figures are equal to the proportion of negative-affect memories reported by adults recalling their first year of college (Pillemer, Goldsmith, Panter, & White, 1988), indicating that memories from early childhood are no more likely to be either positive or negative than those for other periods of life.

Other theories of childhood amnesia have been more cognitively oriented. (See Nelson, 1993a, for a discussion of these theories). Perhaps the simplest cognitive explanation for the paucity of memories from early childhood is that memories simply were not formed during that period. This assumption fit with the overall view of children as mnemonically incompetent that prevailed up until the mid 1970's. Research done over the last 15 to 20 years, however, has dramatically changed the prevailing view of children's memory competencies, demonstrating that while certainly not on par with adults in every respect, under the right conditions, young children remember certain types of information quite well. DeLoache and Brown, (1979), for example, demonstrated that children as young as 20 months old could remember overnight the location of toys they watched being hidden. DeLoache, Cassidy, and Brown (1985) further revealed that young children employed what they termed proto-strategic behaviors in such memory tasks. Baker-Ward and Ornstein (1988) found that young children often actually outperform adults on memory games in which locations of objects must be remembered, such as Concentration. (See Flavell, Miller, & Miller, 1993; Kail, 1990; Weinert & Perlmutter, 1989 for general reviews of the literature on early memory development).

Nelson (1986) argued that one reason children appeared to be mnemonically incompetent was the type of memory tasks used. When children are tested on their ability to learn lists of nonsense syllables, or even words, they do very poorly. Based on research using such measures, the conclusion was made that memory skills in children were generally inferior. In response to this issue Nelson and her colleagues (Nelson, 1986) began to investigate children's memories for everyday events. This research established that preschool children develop quite good memories, in the form of scripts or generalized event representations, of routine events like going to McDonald's or having snack at nursery school. Script representations of such events may, in fact, be in place after only one experience with the event (Fivush, 1984; Hudson & Nelson, 1986; Nelson & Gruendel, 1986). Subsequent research has shown that children as young as 16 months form script-like representations of events and are sensitive to aspects of events such as temporal ordering (Bauer & Mandler, 1989).

Most germane to the issue of autobiographical memory, a growing body of research has demonstrated that very young children can recall novel events that occurred in the relatively distant past. Fivush, Gray, and Fromhoff (1987), for example, interviewed 29- to 35-months olds about personally experienced events and found that these children could recall events that had taken place more than 6 months earlier. Likewise, Fivush and Hamond (1990) demonstrated that 4-year-olds could recall events (for example, going to Disneyworld) that took place prior to age 2 1/2. When non-verbal evidence for memory is taken into account, the picture is even more impressive. For example, using deferred imitation, Bauer and Shore (1987) established that children as young as 16 months could reenact a novel sequence of events after a 6-week delay. Myers, Clifton, and Clarkson (1987) contend that 3-year-olds who participated in a study of auditory space at 6 to 40 weeks of age showed non-verbal evidence of retention for the action sequences involved. Thus, converging evidence from several lines of research makes it highly unlikely that infantile amnesia is the result of an inability of very young children to form memories.

A second relatively straightforward cognitive explanation for infantile amnesia suggests that memories are actually formed in early childhood, but are forgotten over time. Consequently as people get older they are increasingly likely to be unable to recall events from their earliest years. This explanation implies that older adults should recall fewer events from early childhood than younger adults, who should recall less than children, simply because of the longer retention interval. Although this notion is intuitively appealing, data on autobiographical memory in adults do not support it. Under some circumstances older adults can recall information about events that took place as much as 50 years earlier (Bahrick, Bahrick, & Wittlinger, 1975), while it is difficult for children to remember things from only a few years past, a much shorter retention interval. Wetzler and Sweeney (1986), in fact, have plotted a forgetting curve for the number of adult memories recollected back to age 5, and demonstrated that this curve cannot account for the small number of memories retrievable before age 5. In other words, forgetting seems to be accelerated for the period of early childhood, regardless of age at the time of recall. This seems to indicate that while childhood amnesia is a real phenomenon, it is attributable to more than simple forgetting over time.

An alternative explication proposed by Schactel (1947) and Neisser (1962) invokes both cognitive and social factors. This theory holds that memories are formed in early childhood, but are organized in a way that makes them inaccessible later in life. According to this view, autobiographical memory is a reconstructive process that involves reinterpreting previously stored material. As children become older, socialization forces an increasing reliance on language, as well as a change in orientation towards responsibility and reality. This in turn causes mental structures to become reorganized in such a way that they are incompatible with earlier structures, rendering memories organized within those earlier structures irretrievable. This explanation implies that any memories that are formed during early childhood would be qualitatively different in structure from those formed later in life.

Recent research on young children's memory renders this idea less than adequate as well. For example, Nelson's (1989) recordings of one child's (Emily's) crib monologues and her extensive research on script memory, discussed above (e.g., Nelson, 1986), as well as the work of Fivush and her colleagues (e.g., Fivush, Gray, & Fromhoff, 1987) indicate that even though overall memory performance is poorer than that of older children and adults, children between the ages of 2 and 5 organize information in memory in a manner similar to that of adults. Indeed, Nelson (1993a) argues that young children structure, represent, and interpret reality in ways that are continuous into adulthood. If this is the case, then socially induced structural change is also an inadequate explanation for infantile amnesia.

A Social Interaction Model of Autobiographical Memory

More recent theorizing (e.g., Fivush, 1991; Fivush & Hamond, 1990; Hudson, 1990; Nelson, 1988, 1990, 1993a, 1993b; Pillemer & White, 1989) has begun to regard the development of autobiographical memory as a result not only of improved cognitive abilities, but also as a result of social factors as well, social interactions with others in particular. This work is conceptualized from a Vygotskian perspective. Vygotsky (1978) maintained that all higher mental functioning develops dialectically through social interactions. According to Vygotsky, social interaction provides children with the "tools" (e.g., language) necessary for thought, and over time, children internalize these tools for their own use. Thus cognitive development in general can be viewed as a result of collaboration between children and more cognitively skilled others. Fivush (1991; Fivush & Reese, 1992) and Hudson (1990), working from this Vygotskian perspective, have asserted that the development of autobiographical memory can best be understood through a social interaction model. According to this idea, autobiographical memories are formed through a process of social construction. As children participate in memory talk, they gradually gain an understanding of how memories are structured and recalled. In literate Western cultures autobiographical memories take the form of canonical narrative structures. In very early childhood, as adults engage their children in discussions of past events they provide this narrative structure as well as the content. With the passage of time, children begin to internalize this structure and provide more of the content on their own. As children's skills increase, adults gradually withdraw their scaffolding, and by the time children are 3 to 4 years old they are able to produce a reasonably coherent narrative autonomously. Interestingly, the age at which children begin independently to produce these coherent narratives coincides roughly with the end of the infantile amnesia period.

Nelson (1993a, 1993b) expands the social interaction model, and asserts that it is necessary to go even further to truly understand the emergence of autobiographical memory and the concomitant end of the infantile amnesia period. What also must be considered, Nelson contends, are the different functions that memory can serve. The type of information recalled will depend on its usefulness at the time. For very young children who have little experience with the world, remembering routine activities and commonplace objects is most adaptive, because it allows the child to understand her environment and predict what might happen next. Thus, events that a child encounters on a daily basis are likely to be remembered, not just because they occur frequently, but because these memories help the child function effectively.

This idea fits well with the findings of Nelson and her colleagues (Nelson, 1986) that many of children's earliest memories are in the form of scripts, or generalized event representations. Script memories allow a child to predict what should take place when she goes to McDonald's, for example, or when it is bedtime, and thus allow her to better adapt to her environment. Only later, as children become more verbal and begin to engage in conversations with others do they gain an understanding of the social and cultural functions that memory serves (Nelson, 1990, 1993a, 1993b). They come to realize that sharing recollections of one-time events is valued and thus begin to retain those memories of one time events which would have previously been dropped. Finally, as children's language skills advance, they begin to use the verbal representations provided by their conversational partners in discussions of past events to reinstate their own memory of the event under discussion.

Accordingly, social interaction provides three types of tools to facilitate the emergence of autobiographical memory: first an understanding of the value of such memories, second, the structural forms those memories conventionally take, and third, the ability to use another's verbal representation of an event to reinstate memory. Through participating in conversations about the past children internalize these tools that enable the autobiographical memory system to emerge from more generic episodic memories.

Nelson's argument reconciles the apparent contradiction in research findings that show both that very young children do retain memories for events in the relatively distant past (e.g., Hudson, 1990; Fivush, Gray, & Fromhoff, 1987; Fivush & Hamond, 1989, 1990) and also that later on, memory for these events seems to be nonexistent. Memories for one-time events may be retained for a period of time, and thus available for recall. But because these memories have little predictive value if the events do not reoccur, they are eventually dropped, and so later in childhood, events that were once recollected are no longer available. For example, Hudson (1990) reported that her daughter Rachel, at age 2 could recall information about events that had occurred up to 10 months earlier; however, by age 8 she recalled little about these events (Nelson, 1993b). Similarly, at age 6 Emily, the child in Nelson's work on crib talk, recalled little about the events she had talked about as a toddler (Nelson, 1993a. 1993b). Routine events that do have predictive value go on to become incorporated in scripts. It is not until around the age of three to four, when children begin to internalize the tools made available through social interaction, that they begin to retain memories for novel events in a form that will be available later in life.

The Role of Social Interaction

The social interaction model argues, then, that the effects of participating in memory talk are three-pronged. Children are learning why memory talk is valued, they are gaining the ability to use the verbal representation of an event provided in conversation with another to reinstate their own memories, and they are learning how to construct such memory talk in a conventional form. The first point is relatively more difficult to demonstrate empirically.

Hudson (1990), however, followed her own daughter Rachel's emerging ability to recall and talk about the past. She contends that rather than incorporating specific material to later recall, what her daughter gleaned over a period of months from these conversations was a global understanding that talking about the past was a joint venture, something to be shared with others. She also gained an understanding of how to participate in, and eventually initiate these conversations. Rachel, Hudson concludes, "began to interpret the conversations not as a series of questions to be answered but as an activity of remembering" (p. 183).

Fivush (1991) makes related arguments about the role of joint conversations about the past in imparting the social significance of memory talk. She argues that mothers may be giving subtle messages about the value of memory talk in the way they carry out such dialogues. Mothers who provide very dense, rich narrative accounts of the past may be conveying more strongly to their children that this is a valued activity than mothers who structure these conversations as a series of questions without much elaboration or contextual information. Consequently, children of such mothers may construct more elaborate autobiographical memories themselves, in part because they have come to value the activity more highly.

The second role of social interaction, that of providing verbal representations of an event to reinstate the event in the child's memory, is perhaps the least clearly delineated to date. One issue here is the difference between rehearsal and reinstatement. Nelson (1993a) argues that rehearsal should strengthen memory for the specific aspects of the event under discussion. Reinstatement, on the other hand, is a more general type of strengthening that requires only exposure to some part of the event. Rovee-Collier and her colleagues (Rovee-Collier & Hayne, 1987) have demonstrated that a learned response can be strengthened and retained over a longer period of time if the infants are re-exposed to the learning context before forgetting occurs. Fivush and Hamond (1989) and Sheffield and Hudson (1994) found similar behavioral reinstatement effects: children who were re-exposed to some part of an event could behaviorally reenact the event for longer periods of time than children who had not experienced the re-exposure. Little work to date has addressed the issue of verbal reinstatement, particularly the age at which children might be able to utilize such means of reinstatement. Nelson (1990), however, sees this as an achievement of the late preschool years.

Whether memory talk serves as a form of rehearsal has been addressed. If in fact talking about certain events operates as rehearsal, then in repeated conversations about the same event, children should begin to incorporate information provided by parents in previous conversations.

However, several lines of research examining this indicate that this is not happening. Hudson (1990) recorded mothers and their 2-year-olds conversing about the same four events once a week for 4 weeks and then had an experimenter interview the children about these events. She found that while the children's ability to participate in conversations about the events improved across sessions and the children recalled new information about the events at each session, they did not include information provided by their mothers in earlier conversations. Similarly, Fivush and Hamond (1990) and Fivush, Hamond, Harsch, Singer, and Wolf (1991) examined young children's recall of past experiences in repeated interviews, and found that the children reported additional information about the events discussed at each session, but that this information was new material, not provided by the mothers in the earlier interview. Therefore it seems that talking about the past is not providing material to be recalled in the future, nor is it serving as rehearsal of the event under discussion.

The third role that memory talk appears to be playing is teaching children how to construct narrative accounts of remembered material. Through conversing about the past, children may be gaining the skills necessary to carry out this activity independent of adult guidance. Several lines of research support this notion. Eisenberg (1985) followed the language acquisition of two children between the ages of

18 and 36 months. She found that the children passed through three phases in learning how to talk about the past. At first, adults provided the content as well as structuring the conversations while the children simply answered yes-no questions. Later the children began to add memory information to the conversations, and finally began to initiate conversations about the past with others. Eisenberg contends that before children can initiate and fully participate in memory talk, they must learn the appropriate linguistic forms for such talk, and conversational interactions with others help them attain these skills.

McCabe and Peterson (1991) recorded memory conversations between parents and their children at 27 months and again at 31 months, and interviewed these children at 42 months. They found that the children's ability to produce a coherent narrative at 42 months was related to how their parents structured the earlier conversations. McCabe and Peterson argue that narrative structure emerged in these children in response to what others, primarily their mothers, were doing in these conversations. Fivush (1991) also examined the effect of mother-child conversations about the past on the subsequent ability of the child to construct narrative accounts of the same events. She found that although the amount of information provided by the mothers did not affect the amount of information recalled later by the children, the way this information was recounted did have an effect. Specifically, mothers who used more complex temporal links and provided richer, more elaborate accounts of past events had children who later constructed more complex and elaborate narratives themselves.

Thus, based on work examining conversations between mothers and young children, Eisenberg (1985), Fivush (1991), and McCabe and Peterson (1991), have all concluded that children are learning how to construct memory narratives by participating in memory talk with adults. Early on, parents provide the necessary narrative structure. Over time, children seem to internalize this structure until they can produce coherent narrative accounts of prior experiences on their own.

Maternal Style

One compelling finding that has emerged from research on memory talk is that mothers show different conversational styles in conversing about the past, and that these differential styles may affect the subsequent development of autobiographical memory (Fivush, 1991; Fivush & Fromhoff, 1988; Hudson, 1990; McCabe & Peterson, 1991; Reese & Fivush, 1993; Reese, Haden, & Fivush, 1994). Two distinct maternal styles have been documented, distinguished by the types of questions asked and the amount of contextual support and elaboration provided within the conversation. Mothers who demonstrate what has been labeled as an elaborative or narrative style tend to ask open-ended, detailed questions. When their children seem not to recall information about the event under discussion, these mothers go on to provide the information themselves, and to continue to pursue the topic. This is illustrated in an excerpt from Reese and Fivush (1993) in which a parent and child are remembering a trip to the aquarium.

> P: Did we see any big fishes? What kind of big fishes?
> C: Big, big, big.
> P: And what's their names?
> C: I don't know.
> P: You remember the names of the fishes. What we called them. Michael's favorite kind of fish. Big, ugly fish.
> C: Yeah.
> P: What kind is it?
> C: um, ba
> P: A ssshark?
> C: Yeah.
> P: Remember the sharks?
> C: Yeah.
> P: Do you? What else did we see in the big tank at the aquarium?
> C: I don't know.
> P: Remember when we first came in, remember when we first came in the aquarium? And we looked down and there were a whole bunch of birdies in the water? Remember the name of the birdies:
> C: Ducks!
> P: Nooo! They weren't ducks. They had on little suits. Penguins. Remember, what did the penguin do?
> C: I don't know.
> P: You don't remember?
> C: No.
> P: Remember them jumping off the rocks and swimming in the water?
> C: Yeah.
> P: Real fast. You were watching them jump in the water, hm.
> C: Yeah. (p.606)

Although this child contributes almost no information to the conversation, the mother continues, embellishing the account with additional details. In contrast, mothers who display a more repetitive or paradigmatic style tend to ask simple yes-no questions or to relentlessly pursue one specific answer. As illustrated in the following excerpt (Reese & Fivush, 1993), these mothers fail to embellish their narratives with extra information and are inclined to repeat questions or switch topics in response to unanswered probes.

> P: How did we get to Florida, do you remember?
> C: Yes.
> P: How did we get there? What did we do? You remember?
> C: Yeah.
> P: You want to sit up here in my lap?
> C: No.
> P: Oh, okay. Remember when we went to Florida, how did we get there? We went in the __________?
> C: The ocean.
> P: Well, be-, when we got to Florida we went into the ocean, that's right, but how did we get down to Florida? Did we drive our car?
> C: Yes.
> P: No, think again, I don't think we drove to Florida. How did we get down there, remember we took a great big ___________? Do you remember? (p. 606)

This parent is clearly seeking one specific piece of information, and when the child remembers another piece of information about the event (that they went in the ocean), the parent moves the conversation back to the original question, rather than pursuing what the child recalled.

Given the pervasiveness of these stylistic differences in talk about the past, it should not be surprising that they play a role in the development of autobiographical memory. In fact, research has consistently demonstrated that mothers who are more elaborative and provide more information have children who recall more information and construct more elaborate narratives themselves than mothers who simply question and repeat information (Hudson, 1990; Fivush, 1991; Reese, Haden, & Fivush, 1994; Reese & Fivush, 1993). As previously noted, it is not the case that the children of elaborative mothers are simply recalling the information given to them by their mothers in the previous conversations. Rather it seems that by providing rich contextual support, these elaborative mothers are expediting their children's learning of the kinds of information typically included in memory narratives, and perhaps more importantly, how to go about constructing these narratives. Through the richness of these conversations, they may also be giving their children subtle messages about the overall value of reminiscing about the past.

Interestingly, all mothers show aspects of both repetitive and elaborative styles when talking about the past. In fact, when children provide memory responses or when they make no response at all, no maternal stylistic differences are apparent. Such differences between styles become most obvious when children respond, indicating a willingness to continue the conversation, but provide no memory information. When this occurs, elaborative mothers provide more and more contextual information while repetitive mothers simply repeat the question previously asked or switch topics. What is it that causes these stylistic differences to emerge?

Determinants of Maternal Style

There are several potential determinants of maternal style in memory talk. Most simply, maternal style might be a trait of the mother. Alternatively, stylistic differences might be a function of the context in which the conversation is taking place. Finally, maternal style might be elicited by behaviors or characteristics of the child involved in the interaction. It is also possible that characteristics of the mother, characteristics of the child, and the context interact to determine conversational style

Style as a Maternal Trait

The first idea suggests that maternal style is simply a characteristic inherent in the mother, something that has emerged in the course of development and that she brings into all interactions. This notion gains some support from work done by Reese and Fivush (1993) indicating that fathers show these same stylistic differences. Further, maternal and paternal styles are independent; that is, mothers and fathers in the same family do not adopt complementary styles, with one parent being more elaborative and the other more repetitive, not do they tend to show the same conversational style. This latter finding would seem to argue against conversational style being elicited by characteristics of the child. However, this lack of concordance between parents dealing with the same child could result from differing parental response to child individual differences as well. It is still plausible, therefore, that stylistic differences are multiply determined and are a function of who the mother is interacting with and what kind of interaction is taking place.

Effects of Context

A second possibility is that maternal stylistic differences evolve as a result of ongoing mother-child interactions in a variety of settings and then are carried over to conversations about the past. Only a few studies to date have looked at maternal style in situations other than memory talk. Tessler (1986), for instance, found stylistic differences in how mothers interacted with their children during a visit to a museum that were similar to the differences occurring at the time of recall. These differences emerged even though one group of mothers had been instructed to interact with their children as they normally would, and the other group had been instructed only to answer questions from their children.

In a follow-up study, Tessler (1991) found evidence for consistency in maternal style across three situations--picture-book reading, picture-taking, and memory talk. Tessler also found that children showed a marked preference for the style used by their own mothers. When questioned by an experimenter using the opposite style, they tended to reframe the question in the style of their mothers. Tessler argues that maternal style is playing an important role not only at the time of recall, but across many situations. By helping children attend to different aspects of an event and framing discussions about that event, mothers in essence may be shaping how their children view the world, and they do this in a similar manner across different settings or contexts.

Other comparisons of language use across different settings have not found the same sort of consistency evident in Tessler's work. For example, several studies have shown that mothers talk differently in different contexts (e.g., Hoff-Ginsberg, 1991; Jones & Adamson, 1987; Lewis & Gregory, 1987). However, none of this research examined individual stylistic differences among mothers. Rather it focused on group differences in language use in different situations.

More pertinently, Haden and Fivush (1993) compared individual maternal style during a free-play situation with maternal style in memory talk and found no relation between the two. Specifically, mothers who were highly elaborative during talk about the past were no more likely to be highly elaborative in free play than other mothers. Haden and Fivush argue that maternal styles vary as a function of the conversational context, and will be dependent upon how each mother views the task at hand. Consequently, maternal style and its concomitant effect on development will be much more context specific. Given these contradictory findings, the role that context plays in affecting maternal style, if any, is not clear.

Effects of Child Individual Differences

Bidirectional causality. Despite the emphasis on social interaction in the research on stylistic differences in memory talk, it has, for the most part, neglected any role the child might play in influencing the process. For the most part, interactions are seen as adult-driven, and the child as a somewhat passive recipient. Bidirectional or reciprocal causality is sometimes acknowledged as a possibility, however. McCabe and Peterson, (1991), for instance, have found that children's discourse skills at 27 months are correlated with maternal language style at 31 months. They argue that mothers may be fine-tuning their talk in response to that of their children.

In a longitudinal study of mother-child memory talk Fivush and her colleagues (Reese, Haden, & Fivush, 1994), have found both concurrent and long-term correlations between maternal style and child memory response. That is, at each of four timepoints, mothers' level of elaboration was correlated with children's memory responses. Cross-lagged correlations indicated that mothers' level of elaboration at the first timepoint (when the children were

40 months old) was also correlated with children's memory responses both 1 1/2 and 2 1/2 years later. In other words, children whose mothers used a more elaborative style when they were 40 months old recalled more at the later timepoints. Furthermore, at the third and fourth timepoints, mothers' elaborations and children's memory responses were highly intercorrelated. Reese and Fivush assert that these later relations are certainly bidirectional, but argue that there is no strong evidence that children's responses in the earlier interactions affect mothers' level of elaboration either during those conversations or at the later timepoints. However, as they acknowledge, children may be influencing maternal style in ways not directly associated with memory talk.

These other sources of potential bidirectional influence have not been fully explored. Consequently, in order to gain a better understanding of maternal style differences and their ultimate effect on the emergence of autobiographical memory it becomes essential to consider what exactly children might be contributing (besides memory responses) that could shape maternal style. Bronfenbrenner (1989a, 1989b) has identified several ways children's characteristics and behavior can actively shape their development. Among them are personal attributes that affect treatment received from others (e.g., a fussy or unattractive baby may elicit a very different reaction than would a happy, cherubic infant) and differences in levels of sociability and other temperament variables that might influence a child to seek out different types of interactions, as well as elicit differing responses from others. Bronfenbrenner points out that the contributions of the child to interactions with others "do not determine the course of development; rather they may be thought of as 'putting the spin' on a body in motion" (1989b, p.12). In other words, behaviors and characteristics of individual children can influence their development, and this deserves consideration.

Language skills. It seems quite plausible that the language abilities of the child involved in the interaction might mediate maternal style. However, attempts to link child language skill per se to maternal style in recalling the past have not borne out. Hudson and Sidoti (1988) found no correlation between maternal style and child's age or MLU for children between 24 and 30 months old. Reese et al. (1992) also reported no differences in child MLU at 40 months between the children of elaborative and repetitive mothers, and thus concluded that children's language ability was not related to maternal style.

Nonetheless, it still seems feasible that mothers' style in memory talk is being influenced by children's language skills. It may be the case, however, that children's discourse skills may be more crucial than their level of language development as measured by MLU. In other words, children's ability to introduce and maintain a topic, as well as other discourse skills, may affect parent's perceptions of their child's language and cognitive skills, and these perceptions will be reflected in how they talk about the past. As McCabe and Peterson (1991) demonstrated, mothers tend to fine-tune their conversational style in response to children's narrative skills. It may be possible that mothers of children who are more skilled in participating in verbal exchanges come to expect a response from their children, and thus work harder to elicit one when talking about the past.

Gender differences. Maternal style may also be shaped by child individual differences beyond language skill, such as gender and temperament. Research has already indicated that level of elaboration in maternal style may be moderated by gender differences. Reese and Fivush (1993) have reported that both fathers and mothers tend to be more elaborative with daughters than with sons, and that these gender differences carry over to recall at later timepoints, with girls recalling more than boys. Direction of causality is not clear, however. One possibility is that daughters are more responsive than sons and thus elicit more elaboration from their parents. Alternatively, parents may be more elaborative with daughters than sons regardless of the child's particular response.

Although Reese and Fivush acknowledge that there may be some bidirectionality, they argue that the gender difference in level of elaboration is primarily parent-driven, possibly a result of differing parental expectations for sons and daughters. Specifically, they argue that memory talk is more valued in females than males and consequently both mothers and fathers expend more effort in eliciting memory responses from daughters than from sons. This idea is supported by research on adult memory indicating that women think more about the past and value memories more than do their husbands, and that both husbands and wives view women's memories as more accurate (Ross & Holmberg, 1990).

Nevertheless, it is still possible that parents are influenced more by individual child characteristics than by their own expectations or biases. One way to tease these effects apart would be to look at within-family patterns of interaction. Research to date has looked only at parents conversing with one child. It is not clear, however, whether parents would be more or less elaborative in interactions with other persons, particularly with other offspring. If gender-based parental expectations about memory are the causal factor, then parents might be show very different styles when conversing with their sons than with their daughters. If, however, level of elaboration is predominately a personal trait, not influenced by other factors, then parents might be equally elaborative with sons and daughters. By examining maternal conversations with opposite gender siblings it will be possible to learn more about the influence child gender has on parental conversational style.

Temperament differences. Child-temperament could work to mediate maternal style as well. Children with differing temperamental characteristics might elicit differing maternal styles both in daily interactions and in conversing about the past. Temperament can be conceptualized in several different ways (see Goldsmith, Buss, Plomin, Rothbart, Thomas, Chess, Hinde, & McCall, 1987, for a review), but generally includes dimensions such as activity level, emotionality, and sociability. These characteristics have been invoked as possible contributors to differential developmental outcomes in a number of areas. A study examining individual differences in language development, for example, found modest positive correlations between sociability and a rote/holistic/imitative language style (Bates, Bretherton, & Snyder, 1988). Bates et al. attribute this to a greater need of the sociable children to be with and to be like others. Additionally, Slomkowski, Nelson, Dunn, & Plomin, (1992) found relationships between temperament at age 2 and language skill at age 3 (both receptive and expressive) and at age 7 (receptive language as assessed by a standardized battery of language measures). Slomkowski et al. acknowledge that the causal links between temperament and language are not clear, but speculate that highly sociable or extraverted children may engage their parents in more interactions which in turn facilitate language development.

Although neither of these studies looked at memory talk, it is reasonable to extend these ideas to such talk. If sociable/extraverted children are eliciting more parental interaction, they may also be eliciting a more elaborative style in memory talk. Fivush and Reese (1992) suggest that some children may be more interested in social interaction than others, and thus elicit a more elaborative style from parents, and it may be the case that these children have more sociable or extraverted temperaments. Children with other temperamental characteristics may affect maternal style in other ways. For example, children who are highly impulsive and highly active, or easily distracted may in general elicit more directive speech from parents simply to control their behavior and keep them on task. This stylistic difference could lead to a more repetitive style in eliciting recall. Research to date has not looked at the possible relationship between child temperament and maternal style.

Goals and Predictions

The purpose of this study was to further examine the issues raised above, first by looking for evidence of within-family consistency in maternal style, and then by examining the relationship between maternal style and child individual differences, particularly gender and temperament variables. Specifically, are mothers consistent in conversational style when talking to offspring who are different in age and gender? If not, are these stylistic differences elicited by the gender or temperament of the child?

If maternal style is predominately a characteristic of the mother, then mothers should be relatively consistent in conversations with different offspring who differ in age and gender. If, however, maternal style is mediated by characteristics of the child involved in the interaction, then different maternal styles might be apparent when mothers converse with different children. In other words, different maternal styles might emerge with children in the same family, dependent upon the gender, or temperament of each child. In order to examine whether maternal style differs across siblings and is affected by children's gender or temperament, mothers with one son and one daughter participated individually with each child in talk about several shared one-time events. Mothers were also asked to fill out a temperament questionnaire for each child. Data were analyzed to look for consistency in maternal style within families, and for relationships between maternal style and each child's gender and temperament.

Because previous research has not looked at within family patterns, predictions are given as possible outcomes rather than definitive expectations. If maternal style is a characteristic inherent in the mother, then it should not differ across different children in the same family, regardless of gender or temperament differences. Additionally, no relationships between maternal style and child differences would be expected. In other words, level of elaboration should not be related to either gender or temperament. If, however, maternal style is mediated by individual child differences, then maternal style differences should be apparent within families. Specifically, mothers might be more elaborative with daughters than with sons in the same family. Additionally mothers of sociable, extraverted children might be more elaborative than mothers of shy, inhibited, or introverted children, and mothers of very active, impulsive children might be more repetitive.

Further, children's participation in conversations about the past should reflect these individual differences as well. If, in fact, mothers are more elaborative with daughters than with sons, and level of elaboration is related to memory performance, then daughters of elaborative mothers should recall more than sons. If maternal style is affected by temperament as well, then we might find different memory performance in children with different temperaments.

Implications

This work then, attempts to examine the relationship between maternal style in memory talk and child individual differences, particularly gender and temperament. If, in fact, maternal style in memory talk emerges in response to particular child characteristics, such as gender and temperament, this has important implications for other aspects of development as well. For example, it has long been asserted that autobiographical memories play an important role in the formation of a coherent sense of self (Bartlett, 1932; Neisser, 1982; Snow, 1990). Fivush (1991; Fivush & Reese, 1992) further argues that because parents tend to be more elaborative with daughters than with sons, females develop earlier and richer autobiographical memories. It is plausible then, that this might result in gender differences in the development of the self-concept.

Reasoning along the same lines, we might also expect to find differences in the self-concept based on temperament as well. If more sociable or extraverted children elicit a more elaborative style of memory talk, and if this results in these children developing more elaborated autobiographical memories, then these same children might also show differences in self-concept.

More broadly, understanding the causal mechanisms operating to determine maternal stylistic differences would expand our understanding of the role of social interaction in memory development as well. This model is based on the Vygotskian notion that development evolves through interactions between children and others. More cognitively skilled adults provide the necessary tools for mental activity, which the children then internalize and make their own. As children become more proficient at carrying out various activities on their own, adults gradually withdraw support, until the children are operating independently. Implicit in this view is the idea that both adults and children are playing a role in determining developmental outcome. This research may help make the role of the child more explicit. Children may play a part in determine the kind of adult support provided both directly, through their behavior, and more indirectly, through their individual differences. If in fact mothers are responding to individual child characteristics and this in turn affects the construction of the child's autobiographical memory system, then it is clear that this system has been mutually determined, with the child playing an important role. If, however, maternal style does not emerge in response to individual child traits, then it seems clear that the system is primarily adult-driven, and the role of the child is less important. Understanding the determinants of maternal style will help clarify this issue.

METHOD

Subjects

Nineteen White, middle-class mothers with two children, one male and one female, from the Gainesville, Florida, area participated in this study. Three families were dropped from the sample; in one case, the mother failed to ask enough memory questions, and in the other two cases, conversations with the younger child in the family were unintelligible. This resulted in a sample of 16 families; age and gender were counterbalanced within families. Older children were approximately 5 years of age (M = 64 months, range 49 months to 79 months) and younger children were approximately age 3 (M = 38 months, range 29 months to 47 months). Eleven of the mothers did not work outside the home; four mothers worked full-time (40 hr or more per week), and one mother worked part-time (15-30 hr per week). All mothers had attended college; 11 had bachelor's degrees, and two had graduate degrees. Subjects were recruited from existing subject pools, from area daycare centers, and by referral.

Procedure

One female experimenter visited each family twice at their home for data collection. Mothers were told that the goal of the study was to examine how children talk about events they remembered from the past. At the first visit mothers were asked to think of three to five events to discuss with each child. Following previous research (e.g., Reese & Fivush, 1993; Reese, Haden, & Fivush, 1994) mothers were asked to talk about events that occurred only once and were not routine (e.g., birthday parties), and events that they had shared with their children. Mothers chose which child to interact with during the first interview; this choice was generally pragmatically made, based on school and nap schedules and the children's moods at the time of the first interview. After the mothers had chosen events to discuss, the experimenter left the mother and child alone with a tape recorder to discuss the events for as long as they wished. (Mothers also participated in a free play session with each child; task order was counterbalanced across families. Data from the play sessions are not reported here). At the second session the procedure was repeated with the other child.

At the first session, mothers were also requested to fill out a questionnaire on demographic information, and to complete a temperament survey (Dimensions of Temperament-Revised [DOTS-R], Windle & Lerner, 1986) for each child. The temperament survey consisted of 54 statements about different aspects of the child's behavior, for example, "My child can't stay still for very long", "Generally my child is happy", and "My child is hard to distract". Mothers were asked to indicate whether these statements were usually true about their child, more true than false, more false than true, or usually false. These forms were collected at the second visit.

Coding

All tapes were transcribed verbatim, following the conventions of the CHILDES system (MacWhinney & Snow, 1990). Mothers were moderately successful in following the experimenter's instructions about the number and types of events to discuss. The number of events discussed ranged from one to ten. Most of the events discussed involved family outings, for example, trips to Disneyworld and other amusement parks, to the beach, and to visit grandparents. Because of the variability in the number of events discussed, the first three one-time events for which the child recalled at least two pieces of information were selected for coding.

Transcripts were coded using a scheme adapted from Reese, Haden, and Fivush (1994). The coding units for most codes were independent clauses, with each unique or implied verb constituting a new proposition. For some codes (noted below) the coding unit was the instance of occurrence. Although a restricted subset of codes were of theoretical interest in this study, transcripts were coded exhaustively. Codes were mutually exclusive as well.

Maternal Memory Codes

1. Elaborations: Mothers introduced an event for discussion, added new information, or moved the conversation to a different aspect of an event. Elaborations could be either statements or questions.

2. Repetitions: Either the exact content or gist of the mother's own previous utterance was repeated, or mothers attempted to elicit memory but added no new information (e.g., "Do you remember?"; "Tell me about it.").

3. Evaluations: Mothers confirmed or negated the children's previous utterance, sometimes repeating the child's response. Evaluations were coded by instance of occurrence, and were limited to one per conversational turn.

4. Associative talk: Comments that were related to, but not specifically about, event under discussion. These comments contained general information or fantasy talk concerning the event being discussed, as well as mention of future occurrences of the event. Associative talk was also coded by instance of occurrence and limited to one per conversational turn.

5. Metamemory comments: Comments that referred to process of remembering, either for mothers or children.

6. Off-topic talk: Comments that were not related in any way to event under discussion.

Child Memory Codes

1. Memory responses: Children provided new information about event under discussion, moved conversation to new aspect of the event, or requested information about the event.

2. Memory placeholders: Children indicated a willingness to continue in the conversation, but provided no new information. Placeholders could be either repetitions of their own or their mother's previous comments, or phrases such as "I don't know", and were coded by instance of occurrence.

3. Evaluations: Children either confirmed or negated their mothers' previous utterance.

4. Associative talk: As for mother associative talk, comments that were related to, but not specifically about the event under discussion.

5. Metamemory talk: Children's comments about the task or about their mother's or their own ability to recall some information.

6. Off-topic talk: Comments unrelated to the event under discussion.

Two additional codes were used for both mothers and children: clarification questions, when one partner asked the other to repeat an unintelligible comment, and unclassifiable, for comments made by either partner that were not comprehensible.

Two coders independently coded 20% of the transcripts with an average agreement of 86%. One coder coded the remaining transcripts.

Scoring

An elaboration ratio score was computed for each mother-child dyad by dividing the total number of elaborations used within the conversation by total number of repetitions used. A low elaboration score is indicative of a more repetitive style in memory talk; a high elaboration score indicates a more elaborative maternal style.

Temperament Scoring

The DOTS-R assesses temperament along nine dimensions. However, based on the hypotheses, only three of these dimensions, general activity level, approach-withdrawal, and task orientation were considered. Scores for these factors were obtained using the scoring scheme developed by Windle and Lerner (1986). For all three dimensions, higher scores indicated higher levels of the characteristic assessed (i.e., higher activity level scores indicted more active children, higher approach-withdrawal scores indicated a more outgoing child, higher task orientation scores indicated a less distractible child).

RESULTS

Maternal Style Consistency

Analyses focused on two main issues: consistency of maternal style within families and the relationship between maternal style and individual child differences. The issue of consistency was addressed in several ways. First, correlations were computed between the two elaboration ratio scores obtained for each mother (one for each of her children). Significant positive correlations between these scores would be indicative of within-family consistency. These correlations (see Table 1) in fact provided only weak support for such consistency. Elaboration ratio scores were moderately, but significantly correlated when children were compared based on age (older correlated with younger), $r(14) = .43$, $p < .05$. These scores were not significantly correlated when comparisons were based on gender (male correlated with female), $r(14) = .22$. Thus, it appears that when overall level of elaboration (as measured by the elaboration ratio score) is considered, mothers are showing some consistency when comparisons are based on age, but not gender.

To further examine these relationships, correlations were also computed for the two components of the elaboration

Table 2
Correlations Between Maternal Style and Child Individual Difference Variables

	Age	Gender	Activity Level	Approach Withdrawal	Task Orientation
Child					
Age	1.00				
Gender	-.06	1.00			
Activity Level	-.28	.09	1.00		
Approach Withdrawal	-.03	.04	.42	1.00	
Task Orientation	.42	-.13	-.81	-.22	1.00
Child Memory Responses	.30	.01	.18	.12	.02
Elaboration Ratio	.50*	.02	.23	.28	.07
Elaborations	.02	.14	.14	.09	-.10
Repetitions	-.39*	.15	-.21	-.36*	-.05

	Child Memory Responses	Elaboration Ratio	Elaboration	Repetitions
Child Memory Responses	1.00			
Elaboration Ratio	.51*	1.00		
Elaborations	.67*	.38*	1.00	
Repetitions	.07	-.47*	.52*	1.00

*p < .05

ratio score, number of elaborations and number of repetitions. These correlations indicated that number of elaborations used by mothers was quite consistent between older and younger children, $r(14) = .70$, $p < .01$, and between male and female children, $r(14) = .73$, $p < .01$. However, use of repetitions shows a different pattern. Mothers are not using similar numbers of repetitions with older and younger children, $r(14) = .37$, nor with male and female children, $r(14) = .14$.

These findings were clarified by a series of paired t-tests that indicated that elaboration ratio scores were significantly different for older and younger children within the same family, $t(15) = 3.15$, $p < .05$, and that number of repetitions was also significantly different, $t(15) = 2.16$, $p < .05$, but that number of elaborations was not. (See Table 2 for mean scores). In other words, mothers are using about the same number of elaborations in memory conversations with each of their children, but are using more repetitions with the younger children. Paired t-tests based on gender revealed no significant differences for elaboration scores, number of elaborations, or number of repetitions.

To further examine within-family consistency, mothers were categorized as high-or low-elaborative based on a median split of the elaboration ratio scores obtained with the younger child and a contingency table was set up to

Table 2

Mean Number of Maternal Variables and Child Memory Responses by Age and Gender

	Age		Gender	
	Younger	Older	Male	Female
Variable	(*n* = 16)	(*n* = 16)	(*n* = 16)	(*n* = 16)
Maternal elaboration ratio score	3.48 (2.08)	5.34 (2.31)	4.43 (2.6)	4.43 (2.1)
Maternal elaborations	59.13 (34.22)	60.86 (34.86)	64.50 (34.80)	55.50 (33.67)
Maternal repetitions	21.06 (17.22)	12.44 (6.04)	18.81 (15.11)	14.69 (11.63)
Child memory responses	31.13 (15.14)	43.19 (26.29)	37.38 (25.04)	36.94 (19.25)

inspect the probability that mothers would fall into the same category with the older child. A similar contingency table was constructed based on child gender. Chi square analyses were performed on both tables, and both were non-significant. Thus, mothers who are elaborative with one child in a family are not significantly more likely to be elaborative with an older child, or with children of the opposite gender.

Overall, then, it seems that there is a moderate level of consistency in the way mothers talk about the past with children who are different in age and gender. Mothers show the most consistency in the number of elaborations used in memory talk. Lack of consistency is evident in the number of repetitions, with mothers using more repetitions with younger children. Despite the relatively low levels of consistency, gender differences are not manifest in elaboration ratio scores, or in number of elaborations or repetitions.

Maternal Style and Child Individual Differences

Relationships between maternal style and child individual differences across families were examined in several ways as well. First, correlations were computed to examine the relationships between the maternal style variables (elaboration ratio scores, number of elaborations, and number of repetitions) and the child individual difference variables (age, gender, and three temperament factors: activity level, approach-withdrawal, and task orientation). (One family was excluded from these analyses because the mother failed to return the temperament questionnaires, thus N = 30 rather than 32). These correlations revealed several relationships. First of all, age was positively and significantly correlated with elaboration ratio scores, $r(28) = .50$, $p < .05$, two-tailed test. Age was not, however, correlated with number of elaborations, $r(28) = .02$, and was negatively and significantly correlated with number of repetitions, $r(28) = -.39$, $p < .05$, two-tailed test. These correlations are in accord with the findings reported above that mothers tend to use similar numbers of elaborations with children regardless of age, but use more repetitions with younger children.

Second, gender was not significantly correlated with any of the three maternal style variables. This, too, is in agreement with earlier within-family findings that revealed no gender effects. Finally, there was a moderate relation between temperament and maternal style. Approach-withdrawal was significantly and negatively correlated with number of repetitions, $r(28) = -.36$, $p = .05$. As higher approach-withdrawal scores indicate more sociability or outgoingness, it seems that mothers use fewer repetitions with more outgoing children. Activity level and task orientation were not correlated with any of the maternal style variables.

Correlations were also computed separately for each age group to further examine the relationship between temperament variables and maternal style variables. For the older children, activity level was moderately, but not significantly related to number of elaborations, $r(13) = .44$, $p = .10$, two-tailed test. For the younger children, however, several relationships emerged. Activity level was significantly and negatively correlated with number of repetitions, $r(13) = -.52$, $p < .05$, two-tailed test, and significantly and positively correlated with elaboration ratio scores, $r(13) = .71$, $p < .01$. Approach-withdrawal was significantly and negatively correlated with number of repetitions as well, $r(13) = -.58$, $p < .05$. Thus, mothers tend to use more elaborations with older children who are rated as more active. For younger children, mothers use fewer repetitions with children who rated as more active and more outgoing.

Partial correlations partialling out the effects of age were also computed for the maternal style and child individual difference variables. With the effects of age removed, the relationships between maternal style and temperament are still apparent. Approach-withdrawal was significantly and negatively correlated with number of repetitions, $r(28) = -.40$, $p < .05$. Activity level was significantly and negatively related to number of repetitions, $r(28) = -.38$, $p < .05$, and significantly and positively correlated with elaboration ratio scores, $\underline{r}(28) = .44$, $\underline{p} < .05$. Task orientation, however, was not correlated with any of the maternal style variables. Thus, when the effects of age are controlled, the relationship between maternal style and child temperament remains: Children who are more sociable and active elicit fewer repetitions in memory conversations. As a result, a larger proportion of the overall conversation is devoted to elaborations.

Correlations also examined the relationship between the amount of information children recalled and maternal style variables. Memory responses were significantly correlated with both elaboration ratio scores, $\underline{r}(30) = .51$, $\underline{p} < .05$, and number of elaborations, $\underline{r}(30) = .67$, $\underline{p} < .05$. Number of repetitions used by mothers was not correlated with children's memory responses. These correlations are in accordance with previous research (e.g., Reese & Fivush, 1993; Reese, Haden, & Fivush, 1992) indicating that there is a strong relationship between mother's level of elaboration in talk about the past and amount of information recall by children.

Temperament Consistency

Finally, to examine whether mothers rated their children similarly in temperament, correlations were computed between siblings' temperament scores. The correlations revealed that mothers rated their children very similarly on approach-withdrawal when compared by age,

$r(13) = .55$, $p < .05$, two-tailed test, and when compared by gender, $r(13) = .57$, $p < .05$, two-tailed test. There were no significant correlations between siblings' scores on activity level or task orientation.

Group Effects

Finally, analyses of variance were conducted to inspect group effects of child variables on maternal style. Specifically, a 2(gender) X 2(age: younger vs. older) ANOVA was performed for each of the maternal variables (elaboration ratio scores, number of elaborations, and number of repetitions). These analyses yielded no significant effects of age and gender on number of elaborations used. A significant age effect for elaboration ratio score was found, $F(1,28) = 5.54$, $p = .02$. Inspection of the means (see Table 1) revealed that mothers are overall using a more elaborative style with older children than with younger, confirming earlier findings. A marginal age effect was found for number of repetitions, $F(1,28) = 3.48$. $p = .07$. As seen in earlier analyses, mothers are using more repetitions with younger children than with older.

A 2(gender) X 2(age: older vs. younger) ANOVA was also performed to detect gender and age differences in amount of information recalled. Once again, there were no significant effects. Information recalled did not differ for older or younger children, nor did it differ as a function of child gender.

Summary of Results

Taken together, the results of this study indicate that the relationship between maternal style in memory talk and other variables is a complex one. First of all, mothers are only moderately consistent in how they talk to their children. Mothers are most consistent in their use of elaborations in conversations about the past. Number of repetitions used in these conversations, however, varies with age. Mothers tend to use more repetitions with younger children than with older ones. Overall level elaboration as measured by the elaboration ratio score was moderately correlated within families, but nonetheless significantly higher for older children.

Temperament variables seem to be playing a small but significant role in determining maternal style. Overall level of elaboration, as measured by the elaboration ratio score, is related to the child's activity level. Additionally, further influence of child temperament is reflected in the relationship found between number of repetitions and the approach-withdrawal and activity level variables. Here, it seems that mothers use more repetitions with less outgoing children and with less active children. This relationship between temperament variables and maternal style is stronger for the younger children; however, temperament continues to play a role in determining maternal style when effects of age are removed.

In contrast to previous research (Reese & Fivush, 1993), no gender differences were found. Despite the low correlations between elaboration ratio scores for opposite gender siblings, mothers were no more likely to be highly elaborative with daughters than with sons. Nor did girls recall more about the past than did boys. As seen in previous research, children's memory responses are related to level of elaboration. Mothers who have higher elaboration ratio scores have children who recall more in talk about the past.

DISCUSSION

The goal of this study was to examine the determinants of maternal style in memory talk. Maternal style in conversations with children about the past has been shown to play an important role in the development of autobiographical memory. Thus, understanding what factors might influence maternal style differences can further illuminate how social interactions affect cognitive development in general and development of autobiographical memory in particular. Specifically, understanding what role children play in determining their own development, either through their behavior or their individual differences and personal characteristics, can give a clearer picture of how the dialectical process proposed by Vygotsky unfolds.

Consistency Within Families

The first objective of this study was to look for evidence of consistency in maternal style within families. In other words, if a mother uses an elaborative style in memory conversations with one child, is she likely to show a similarly elaborative style with another child? Mothers in this study were moderately consistent in the style used in memory talk with different offspring. At first glance, this might be interpreted to mean that narrative style is solely a characteristic of the mother. However, this conclusion would be premature without a closer examination of the data.

Previous research has demonstrated that regardless of initial level of elaboration, mothers become more elaborative as their children get older (Reese, Haden, & Fivush, 1994). Consequently, when comparing maternal style with siblings, age differences would be expected, with the mother using a more elaborative style with the older child. This study found that trend; despite the finding of a modest level of consistency, mothers did use a more elaborative style with the older child than with the younger child. To get a more fine-grained understanding of what might produce this pattern of findings (moderate within-family consistency and at the same time a higher level of elaboration with the older children) the two components of the elaboration score, number of elaborations and number of repetitions used within the conversation, were considered separately. Recall that elaborations are utterances by the mother that provide information about the event under discussion in the context of probing the child's memory. Repetitions, on the other hand, simply reiterate previously mentioned facts and prompt the child to provide more information. Mothers in this study were remarkably consistent in the number of elaborations used in conversations with older and younger siblings. However, the number of repetitions used differed sharply. Mothers used more repetitions in conversations with younger children than with their older siblings. Thus it appears that mothers' narrative style is relatively similar in conversations with different offspring, but the conversations with the older children contain proportionately fewer repetitions.

This finding contrasts somewhat with the results of Reese et al. (1994). As indicated above, Reese et al. found that in a longitudinal comparison of maternal style, all mothers regardless of their initial classification as elaborative or repetitive, became more elaborative over time. This study similarly found that mothers were more elaborative with older children than with younger. However, Reese et al. attribute the change in level of elaboration to an increase in the number of elaborations used. They report that number of repetitions used did not change across time. This study, on the other hand, found that number of elaborations used with older and younger children was very consistent, but that mothers used fewer repetitions with their older children. The end result, of course, is the same--mothers are more elaborative in overall style with older children than with younger. Further exploration of the underlying basis of this effect (change in number of elaborations used or change in number of repetitions used) is warranted.

Researchers who have looked at within-family consistency in other domains have found that mothers are consistent in their treatment of siblings based on basis of developmental stage but not age (Dunn, 1991). In other words, how a mother interacts with one child at age 3 and one child at age 5 may be very different. However, the treatment the now 5-year-old received at age 3 may be very similar to what the now 3-year-old is currently receiving. This fits somewhat with the findings under discussion. Mothers' narrative style within families shows moderate levels of consistency, but mothers use far more repetitions with younger children, resulting in significantly lower elaboration ratio scores as well. The latter finding might reflect greater sensitivity to the developmental level of each child; the former finding might reflect similarity between the narrative style used in conversations with the present 3-year-old and the style previously used when the now 5-year-old was 3. However, some families in this sample do not fit this pattern. This issue will be raised again in the discussion of the effects of child individual differences.

The current study also examined how gender affected maternal style. Reese and Fivush (1993) have reported that both mothers and fathers employed a more elaborative style in conversations with girls than with boys. They argue that parents are socializing their children differently as a result of implicit gender-related ideas about the importance of memory talk. Based on this finding, therefore, gender differences (and concomitantly, within-family inconsistency) might be expected when mothers are talking to siblings who are different genders; specifically, mothers should show a more elaborative style with a daughter than with a son. Although this study found low within-family consistency when comparisons were based on gender, there were no gender differences in maternal style in memory talk. Mothers were no more likely to be elaborative with daughters than with sons. Nor did girls recall more information about the past than boys.

In summary, previous research has indicated that mothers can be classified as showing clearly different conversational styles when talking about the past (Fivush & Fromhoff, 1988; Hudson, 1990; Reese & Fivush, 1993; Reese, Haden, & Fivush, 1994) and that these stylistic differences are consistent over time (Reese, Haden, & Fivush, 1994). This study further indicates that the same mothers will use similar numbers of elaborations in conversations with older and younger children, but that they use more repetitions in conversations with their younger children. It is important to point out that these within-family trends hold regardless of whether the mother might be classified as elaborative or repetitive in comparison with other mothers. In other words, a mother who uses proportionately more repetitions in memory talk and thus is labeled as having a repetitive style will use similar numbers of elaborations with children of different ages, but more repetitions with younger children.

Effects of Child Individual Differences

The second focus of this study was to examine the effects of child individual differences on maternal style. Several child variables were posited as potential influences: age, gender, and temperament variables, specifically activity level, approach-withdrawal, (a measure of sociability), and task-orientation (a measure of distractibility). As discussed above, age of the child is related to mothers' narrative style in memory talk: Mothers tend to be more elaborative with older children, and in this study, the difference seemed to be driven by the greater number of repetitions used with younger children.

Also as discussed above, there were no child gender differences apparent in the current research. This is in contrast to work by Reese and Fivush (1993) that found that both mothers and fathers were more elaborative with daughters than with sons, and that girls recalled more information about the past as well. Mothers in this study were not more likely to be more elaborative when talking with female offspring than when talking with male offspring, nor did girls recall more about the past. The lack of gender effects evidenced in this study is not easily explained. Reese and Fivush contend that other work has not detected gender differences because of insufficient sample size. They also argue that gender differences may be more evident in older children because, as Block (1983) pointed out, as children get older, parents' differential socialization based on gender tends to increase. The current study included a larger sample than that of Reese and Fivush, and included children as much as two years older, yet still detected no gender differences. Mothers were not differentiating between children based on gender when talking about the past.

No other studies on maternal style have considered the relationship between child temperament and mother's conversational style. This study indicates that maternal style is related to aspects of child temperament. Specifically, activity level is positively related to overall level of elaboration and negatively related to number of repetitions used in memory talk. Approach-withdrawal (or sociability) is also negatively related to number of repetitions. These effects are stronger for the younger children. It seems then, that mothers use fewer repetitions and show a more elaborative style overall in conversations with children (especially younger ones) whom they rate as being more active and more outgoing. Mothers may see their less outgoing and less active children as less engaged in the task at hand, or less responsive overall, and thus use more repetitions to keep them on task and involved. This finding is somewhat similar to that of Dunn and Plomin

(1986). They reported that when comparing mother interactions with sibling pairs, the child rated as more sociable was talked to more and the child rated as more active was talked to less.

It is important to note here that child response was not related to child temperament. Of course, parental perceptions of the child's behavior and the child's actual behavior in a given situation may not be congruent, and parental perceptions of behavior may be related to child temperament. Brody, Stoneman, and Burke (1988) reported that how parents rate their children's temperament affects how they perceive their child's behavior in a given situation. Thus, a parent who believes that her child is sociable and outgoing might react to the same behavior differently with a different child whom she believes has a different temperament. Mothers could perceive children who are quite sociable as good conversational partners in any context, and thus use a more elaborative style in memory talk. Conversely, mothers who see their children as less outgoing may believe that their children are not likely to fully join in any conversation without a great deal of prompting and thus may, in a sense, nag their child into responding by using many repetitions.

Although temperament affected maternal style regardless of the age of the child, the relationship between child temperament and maternal style was strongest for the younger children. Because these children are generally less linguistically proficient, temperament may be playing a larger role in determining how mothers perceive their ability to participate in conversations. As children become more adept conversationalists with age, mothers may be less influenced by temperamental factors.

Child temperament might also play a role in shaping parental beliefs about their children's individual abilities. In almost every case, mothers remarked to the experimenter that their children were very dissimilar and that they would probably react to the task very differently. These comments were not systematically recorded, nor were any attempts made to assess maternal beliefs about children's memory skills or overall cognitive level, and consequently, it is impossible to examine potential relationships between those variables and maternal style.

Research on parental beliefs and their relation with parental behavior indicate that parents do hold beliefs both about general developmental processes, and about specific abilities, and that these beliefs vary widely across (and perhaps within) families (Miller, 1988). Further, although no studies have focused on relations between parents' beliefs about their own child and their behavior toward that child, parental beliefs in general are related to parental behaviors. Thus a mother who holds very different beliefs about her children's ability to participate in a task, or about the age-appropriateness of a task may interact in that task differently with her child, based on those beliefs. Mothers participating in this study clearly felt that the memory abilities of each of their children, and the ability of each child to take part in conversations about past events varied. These beliefs may well have shaped maternal style, and they in turn, may be a function, in part, of mothers' ratings of child temperament.

Implications for a Social Interaction Model of Autobiographical Memory

Having established that maternal style is elicited at least in part by the age and temperament of the children involved, what does this mean for the development of autobiographical memory in general? The social interaction model, as endorsed in various forms by Hudson (1990), Fivush and her colleagues (Fivush, 1991; Fivush & Hamond, 1990; Fivush & Reese, 1992), and Nelson (1988, 1990, 1993) posits that autobiographical memory emerges through a Vygotskian, dialectical process. Accordingly, as children's verbal and memory skills emerge, adults (primarily mothers) begin to engage them in conversations about the past. Through participating in these conversations children learn about the social value of personal memories, they come to be able to use these conversations as verbal reinstatement of their own recollections, and they acquire the ability to construct culturally acceptable narrative accounts of the past.

Children's autobiographical memory systems can thus be view as co-constructed, the result of the joint efforts of the adult and child working together.

Research has previously demonstrated that mothers are sensitive to their children's abilities to engage in memory talk. Early on, when such conversations take place, the mother provides both the content and the structure of the conversation, while the child does little more than agree or disagree (Hudson, 1990; Fivush & Hamond, 1990). In a true Vygotskian sense, mothers are scaffolding their children's participation in talk about the past. Later, as children become more competent participators in memory talk (presumably partially as a result of improvements in both mnemonic and linguistic skills), mothers gradually withdraw their scaffolding and children take on a greater role in contributing both content and structure to the conversations. Ultimately, children gain the ability to independently produce narrative accounts of their past.

Research has also demonstrated that mothers show stylistic differences in how they participate in conversations about the past, in essence differences in the kind of scaffolding provided (Fivush & Fromhoff, 1988; Hudson, 1990; Reese & Fivush, 1993; Reese, Haden, & Fivush, 1994). The basis of these stylistic differences has, for the most part, remained an empirical question. This study is among the first, therefore, to attempt to examine the child's role in influencing what the mother is doing.

Based on these findings, it seems that how mothers participate in conversations about the past may be influenced by their perceptions of the child's abilities and behaviors overall. Mothers who view their children as very active and outgoing employ a different conversational style than do mothers who see their children as less active and more withdrawn. Children's individual differences thus are playing a role in the development of their autobiographical memory systems by influencing the kind of support provided by mothers in conversations about the past. A logical next step, therefore would be to look for links between temperament and autobiographical memory later in life.

These findings also have implications for the development of self-concept. Researchers have long argued the development of the autobiographical memory system and self-concept are linked (e.g., Bartlett, 1932; Neisser, 1982; Snow, 1990). Autobiographical memories allow the child to have a history, and build a concept of self located in time and in relation to others. If in fact, children of more elaborative mothers have richer, more elaborate autobiographical memories, and this in turn affects the child's sense of self, then the child's temperament could be playing a role, albeit somewhat indirect, in the development of self-concept through its influence on level of elaboration. This expands somewhat the idea of a self being co-constructed through interactions with others. Mothers shape their behavior in response to temperamental characteristics of the child; the way the behavior is shaped plays a role in the development of the child's personal history. This in turn affects the way the child views herself. Future research should explore this possibility.

As in other studies examining mother-child conversations about the past, some caveats must be mentioned. First, the generalizability of these findings is certainly limited based on the sample in this study. Participants were, for the most part, from upper-middle class families. All of the mothers had attended college, most had graduated, and few were employed outside the home. This certainly makes them less than representative of the population in general. They are not, however, dissimilar from the participants in other studies of this type. Nonetheless, efforts need to be made to examine memory talk and its various contributors in families of other ethnic, cultural, and socioeconomic backgrounds to determine if the results found here hold up.

Another area warranting further exploration is the relationship between parental beliefs and maternal style. Parental beliefs not only about the specific traits and abilities of their children, but also about the value and age-appropriateness of the task at hand may be playing a role in shaping how parents themselves engage in the task.

This study has shed some light on how maternal stylistic differences might arise. In particular it has shown that child individual differences shape how mothers participate in memory talk with their children. Other research has demonstrated that maternal style in turn influences the way children come to recall the past, and plays a role in the development of autobiographical memory. Thus, perhaps the largest contribution of this study is to empirically demonstrate that development is a reciprocal process, and further supporting a Vygotskian conceptualization of the development of autobiographical memory.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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